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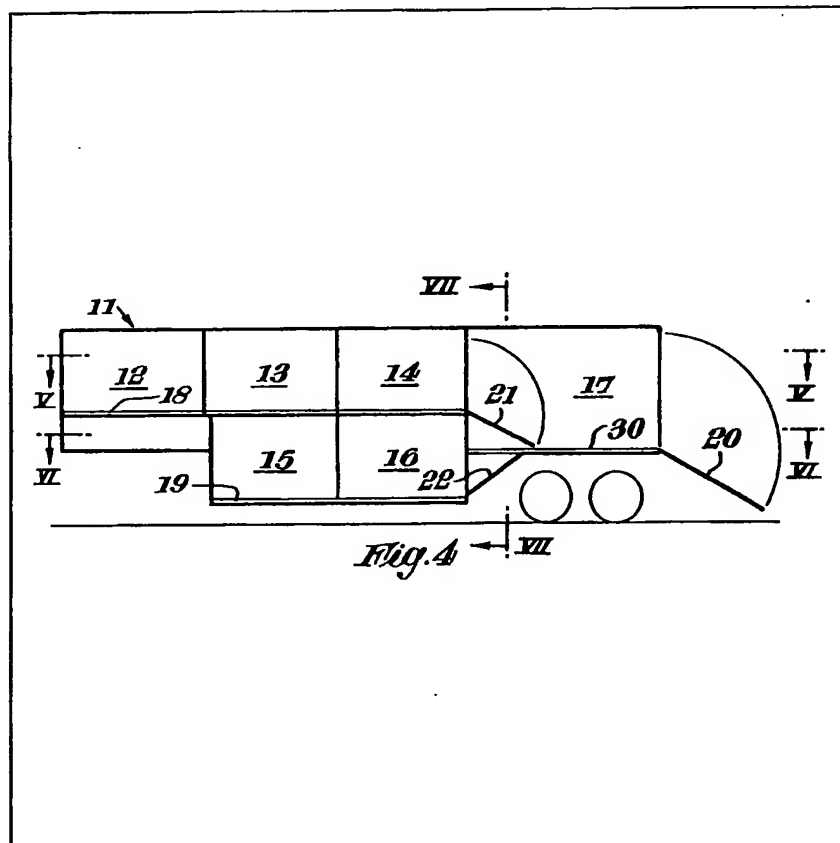
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(54) Transporter for carrying live adult cattle

(57) Such transporters are known. One kind is a single tier vehicle having a low centre of gravity and which is acceptable on Ro - Ro ships. However, the free space above the cattle constitutes wasted space and represents wasted money. Another kind is a two-tier vehicle of an overall height which is not within the maximum laid down in proposed new regulations and which has

too high a centre of gravity to be handled by inexperienced drivers; also, it is unacceptable for Ro - Ro ships.

According to the invention, a rear compartment 17 has a floor height above ground level which is between those of the compartments in an upper tier and a lower tier. The lower tier has two compartments 15, 16 and the upper tier has three 12, 13, 14. The arrangement of the compartments in a vehicle of four metres overall height gives very low centre of gravity.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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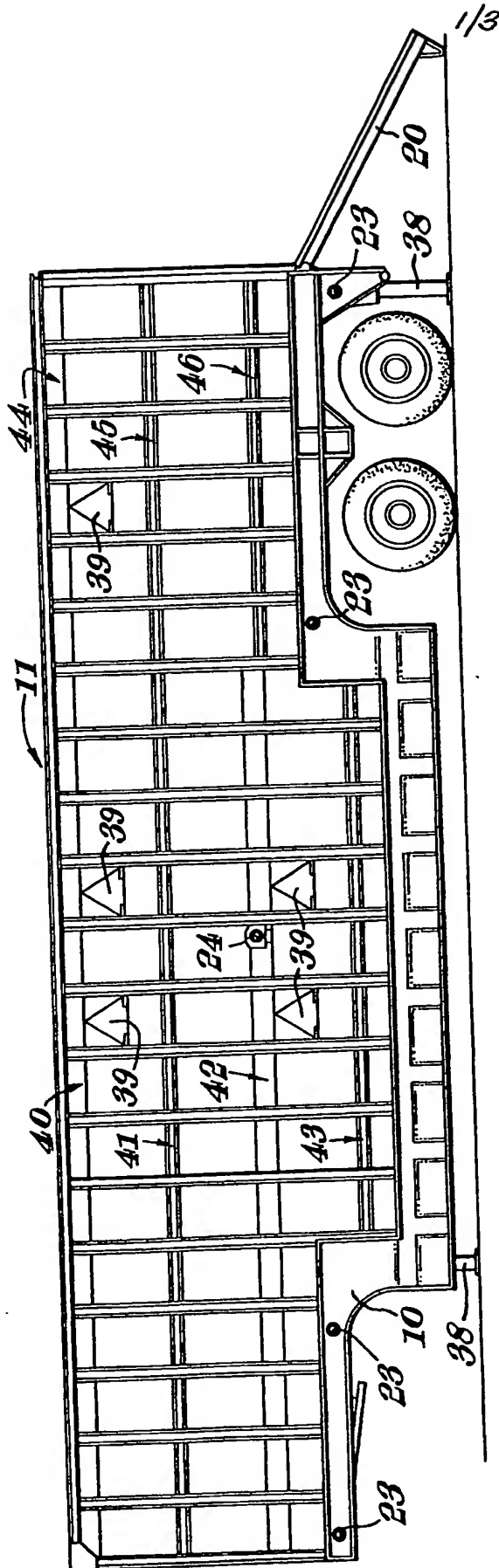


Fig. 1.

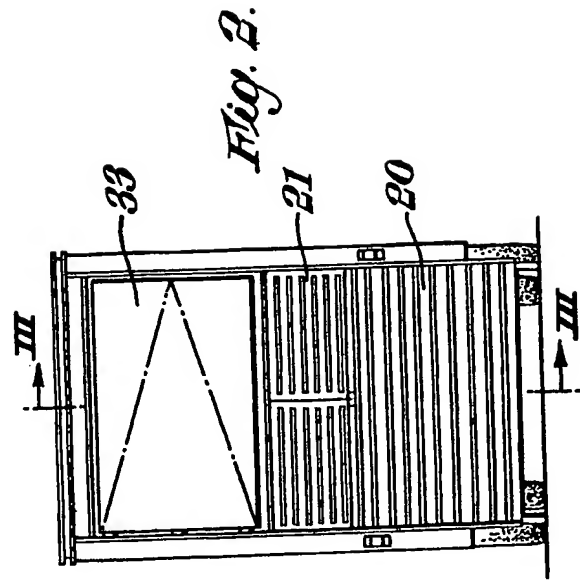


Fig. 2.

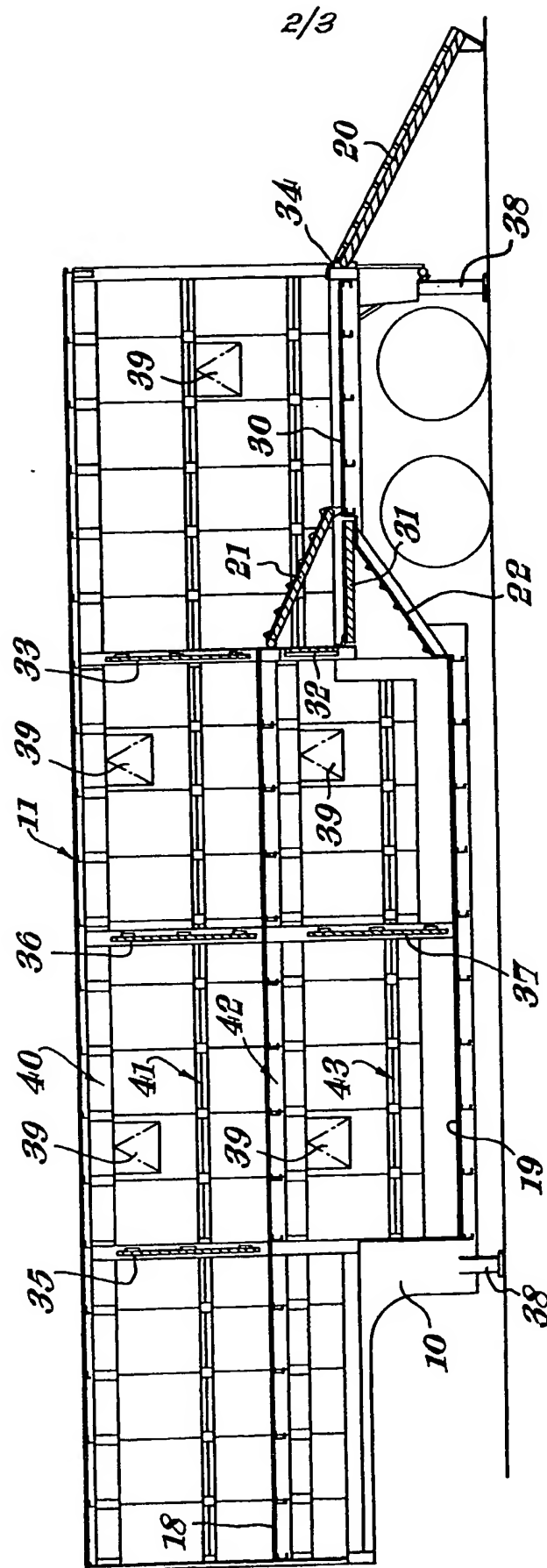
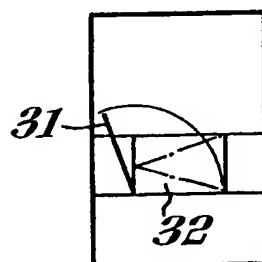
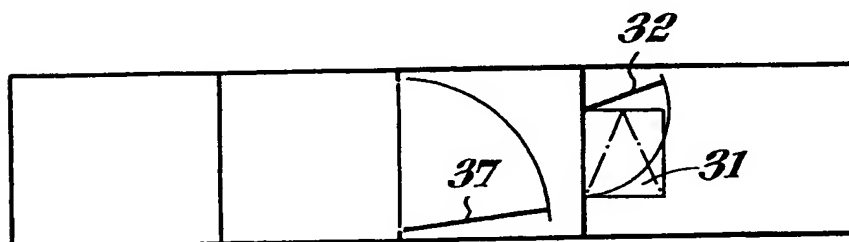
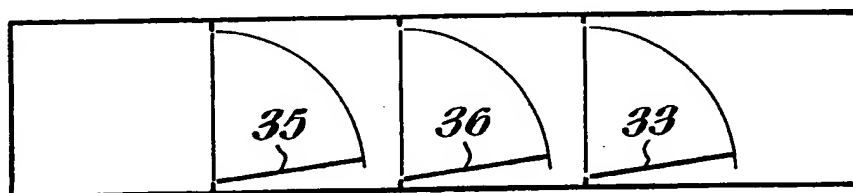
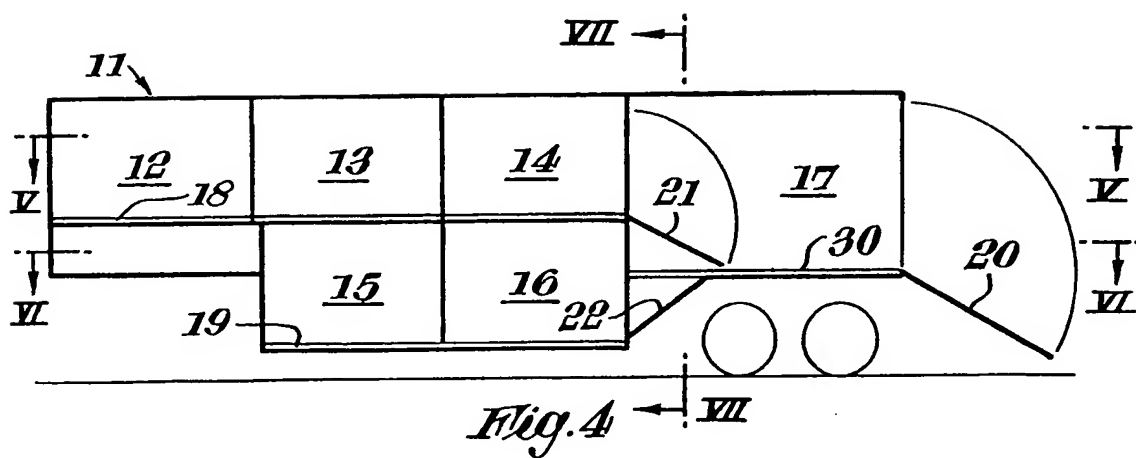


Fig. 3.

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SPECIFICATION

Transporter for carrying adult cattle

- 5 This invention relates to a transporter for carrying live adult cattle.

The economics of transporting live cattle demand as big a payload as is compatible with animal welfare and with road safety. The first consideration necessitates adequate ventilation to enable all of the cattle being carried to breathe fresh air coming in from outside rather than stale (and heated) internal air or at least sufficient free space above the animals to permit the stale air to rise clear of them, and also necessitates not only adequate height of the roof above the floor but also adequate floor space for each animal in order to prevent over-crowding. The second consideration necessitates, among other things, as low a centre of gravity as is possible in order to minimise sway or heeling over when a loaded vehicle negotiates bends and traffic islands on a road; in a number of cases, it has happened (and not only with transporters carrying live animals) that the vehicle heels over in a first direction and thereafter sways back in the opposite direction towards and so far past the vertical position that the vehicle ends up lying on its side on the road.

Another consideration is that of the vehicle, fully loaded with adult cattle, being suitable for a sea passage on a so-called Ro - Ro (roll-on, roll-off) vessel. Obviously, during a sea voyage, the loaded vehicle, which is firmly lashed to the deck, will move with the ship which may be rolling as well as pitching. Even a slight swell could cause an unsuitably designed vehicle to sway unacceptably.

One known vehicle which has successfully taken all of the above considerations into account is a single tier, articulated lorry having a 40 feet long animal-carrying compartment in which there is very ample free space above the animals even when adult cattle are being carried (8 feet from floor to ceiling). A low centre of gravity is obtained by the single-tier construction and this not only makes it safe on roads even when driven by relatively inexperienced drivers but also makes it acceptable on Ro - Ro ships. However, the payload of 22 x 12 cwt (22 x 612 kg) cattle (namely, adult cattle) or 34 x 5 cwt (34 x 255 kg) cattle is not economic nowadays.

Another known vehicle which has taken some of the above considerations into account and which has an acceptable payload has a 34 feet long animal-carrying compartment which is two-tiered. In order to provide the two tiers, the ramp into the upper tier is capable of being raised hydraulically with cattle on it when the remainder of the upper tier is full so as to permit the lower tier to be filled. The payload of the vehicle is good (34 x 10 cwt, 34 x 510 kg or 48 x 5 cwt, 48 x 255 kg) but the overall height of the vehicle is much greater than the proposed regulation height of 4 metres whilst the height of 4 feet 11 inches (1497 mm) from floor to ceiling of each of the cattle-carrying tiers is only sufficient for small adult cattle. Moreover, the centre of gravity due to the upper tier makes the vehicle unsuitable for use on the roads unless in the hands of a skilled and

experienced driver and the vehicle is unacceptable on Ro - Ro ships.

The present invention stems from the realisation that the design of the first-mentioned known vehicle is uneconomical owing to the wasted volumetric capacity, and from the realisation that the second-mentioned known vehicle makes economic use of the volume of the portion of the vehicle which actually accommodates the livestock but in a manner which results in the drawbacks discussed in the preceding paragraph.

Accordingly, the present invention consists in an articulated wheeled vehicle of which the trailer portion has an overall height of substantially four metres and comprises two-tier accommodation for cattle standing transversely of the vehicle; the interior of the accommodation being subdivided by transverse dividers into three upper tier compartments and two lower tier compartments, said two lower tier compartments being situated in vertical alignment with two adjacent ones of said three upper tier compartments; and said accommodation further including a rear compartment of which the rear end is closed by a pivotally mounted tail-gate which, when lowered, acts as a ramp in order to permit cattle to be loaded into the upper tier compartments and into the lower tier compartments by way of the rear compartment and by way of a system of integral ramps which lead out of the rear compartment; the rear compartment being adapted to accommodate cattle, when the other compartments have been filled, on a floor whose height above ground level is between those of the floors of the upper and lower tiers; the side walls of all of said compartments having vertically spaced horizontal substantially uninterrupted ventilator openings therein.

The two lower tier compartments are preferably placed so as to be rearwardly of the front compartment of the upper tier compartments and so as to be forwardly of the rear compartment.

In one generally preferred embodiment of a vehicle according to the present invention, a hinged trap-door forms part of the floor of the rear compartment and is liftable to reveal an angled ramp of said ramp system leading downwardly into the rear one of the lower tier compartments.

Also, in said generally preferred embodiment, the rearmost end of the rearmost compartment of the upper tier compartments is adapted to be closed by at least a hinged device which is part of said ramp system and serves as a ramp, when lowered, giving access to the upper tier compartments. Preferably, however, said device will be supplemented by a hinged door which will need to be closed to confine the cattle in the rearmost compartment of the upper tier compartments before the hinged device is moved into its raised position.

Moreover, when one of the vertically spaced substantially uninterrupted ventilator openings is placed relatively close to floor level or is at a height above floor level which is approximately equal to one half of the back of the animal above floor level, said ventilator opening is defined by the opposed edges of a downwardly directed limb and an up-

wardly directed limb, which limbs constitute parts of respective strengthening pieces and are of appropriate section (e.g. Z - section) and are located in a vertical plane which is disposed outwardly of the plane containing the inner surface of the side wall of the compartment. In this manner, excreta are more likely to be kept within the vehicle, an important factor on Ro - Ro ships which may also be carrying privately owned cars and caravans.

- 10 The present invention is illustrated, by way of example only, in the accompanying drawings, in which:-

Figure 1 shows a side elevation of the trailer portion of an articulated wheeled vehicle according to the present invention, certain members thereof being illustrated in their lowered conditions in which they act as access ramps;

Figure 2 shows an elevation of the rear end of the trailer portion of *Figure 1*;

- 20 *Figure 3* is a section taken on the line III - III in *Figure 2*;

Figure 4 is a schematic representation of what is shown in *Figure 3*;

- 25 *Figure 5* is a schematic representation of a section taken on the line V - V in *Figure 4*; and

Figures 6 and 7 are schematic representations of sections taken on the lines VI - VI and VII - VII, respectively, in *Figure 4*.

- Referring to the drawings, there is illustrated
30 therein the trailer portion of an articulated wheeled vehicle, said trailer portion comprising a chassis 10 (which does not, in itself, form any part of the present invention) on which is supported a cattle-accommodating part 11 of the trailer portion, said part 11 being hereinafter called the body 11 for
35 brevity. The body 11 is very approximately T-shaped in side elevation and is so formed internally as to provide three upper tier compartments 12, 13, 14, two lower tier compartments 15, 16 and a rear
40 compartment 17. The floor of the upper tier compartments is indicated by the reference numeral 18 and the floor of the lower tier compartments is indicated by the reference numeral 19.

- A pivotally mounted tailgate 20 is shown in
45 *Figures 1 to 4* in its lowered position in which it acts as a loading ramp and a pivotally mounted ramp 21 is shown in *Figures 2, 3 and 4* in its lowered position in which it gives access to the upper tier compartments 12, 13, 14. Another and fixed ramp 22 gives
50 access to the lower tier compartments 15, 16.

- The rear compartment 17 has a floor 30 which includes a hinged trap-door 31 (*Figure 3*) whose top surface lies flush with that of the remainder of said floor and which, when lifted in the manner diagrammatically depicted in *Figure 7*, reveals the ramp 22. A
55 vertically hung door 32 adjacent to the trap-door is also operable into the position thereof which is diagrammatically depicted in *Figure 6* to create the necessary head-room for cattle and human personnel of medium height to pass down the ramp 22 into the lower tier compartments 15, 16 without bumping their heads.

- Access to the upper tier compartments is obtained by lowering the ramp 21 about its horizontal hinge
65 axis into the position thereof shown in *Figures 2 to 4*

and by opening a vertically hung door 33 (*Figures 2, 3 and 5*).

- When the upper and lower tiers are full, the ramp 21 is made inaccessible by lifting it into its raised (vertical) position and the ramp 22 is made inaccessible by closing the door 32 and lowering the trap-door 31 into its horizontal position, and more cattle can then be loaded into and accommodated in the rear compartment 17.

- 75 Drainage holes (not shown) are provided at suitable places in the floors. Amongst other uses, these facilitate disposal of foul water when the vehicle interior is washed down.

- The tail-gate is preferably connected, in the vicinity of its hinge, to the floor of the rear compartment 17 by a continuous strip of heavy duty rubber or other flexible material. The purpose of said strip is to retain, as far as possible, all excreta within the rear compartment. In the absence of said strip, excreta may escape past or through the tail-gate hinge and this is undesirable, particularly on Ro - Ro ships.

- The drainage holes in the floors of the compartments could be connected by piping to a tank (not shown) for the retention of excreta but it is preferred to seal the drainage holes so that excreta cannot escape from any of the respective compartments. The prevention of such escape is very desirable, especially when the vehicle is to go on a Ro - Ro ship.

- The upper and lower tiers are divided into the respective compartments by dividers 35, 36, 37 which, in their operative positions, extend transversely of the body 11. The dividers could be and preferably are hinged to the walls.

- The chassis 10 will preferably be provided with means by which the vehicle can be lashed to the deck of a Ro - Ro ship. Said means may take the form of apertures 23 in the sides of the chassis and lashing rings 24 or their equivalent which are mounted on the body 11 (only one such ring has been illustrated on the embodiment shown). In order to provide such lashing rings 24, the body framework is appropriately reinforced by box-section members (not illustrated) to which the rings 24 are secured. Lashing chains would extend through the
110 apertures 23 and the rings 24.

- In order to enhance stability even further during a sea voyage, the vehicle is provided with so-called landing gear 38 at the rear of the vehicle; this landing gear 38 may take the form of legs which are mechanically raised and lowered (see *Figures 1 and 3*). The preferred position for the legs, one at each side of the vehicle, is in the vicinity of the rearmost aperture 23 as seen in the drawing. Another pair of legs or similar landing gear 38 could also be provided near the front end of the trailer portion, as illustrated. Of course, the legs can also be lowered into contact with the ground at other times if required but their principal usefulness is during sea voyages.

- 125 In one embodiment, compartments 13, 14, 15, 16 measure 9'0" x 7' 10½" in plan view, compartment 12 measures 10'0" x 7' 10½" in plan view and compartment 17 measures 11'3" x 7'10½" in plan view. All compartments are at least 5'7" in height. Compartments 12 and 17 accommodate six cattle
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each and each of the other four compartments accommodate five cattle, each animal having 13.5 sq.ft. floor space. This floor space allowance is true in the case of an adult animal of 13 cwt. (663 kg) and this is the true significance of the vehicle according to the present invention. Of course, if smaller cattle are being carried, the number in each compartment can be increased; in fact, 48 x 5 cwt (48 x 255 kg) animals can be accommodated without any unacceptable overcrowding.

The upper tier compartments have walls provided with vertically spaced substantially uninterrupted ventilator openings 40, 41, the lower tier compartments have walls provided with similarly disposed ventilator openings 42, 43, and the rear compartment has walls provided with similarly disposed ventilator openings 44, 45, 46. The elongate openings 40, 42, 44 are relatively wide whereas the openings 41, 43, 45, 46 are narrower and are so made, as described above, as to minimise the possibility of excreta getting out of the vehicle whilst animals are in transit.

Of course, many small details have not been described or illustrated but these are considered to be within the competence of any vehicle builder. The doors or dividers 32, 33, 35, 36, 37 and the trap-door 31 and the tail gate 20 will all preferably have means (e.g. slidable bolts) which will coact with appropriately positioned other means to keep the respective elements in their closed/open or raised/lowered positions.

Two emergency access doors 39 will be provided for each compartment, one in each side thereof, except for the forward-most compartment 12 which has its emergency access door in the front end wall of the trailer portion.

The very low-slung compartments 15, 16 create a very low centre of gravity and, therefore, great stability. This means that even relatively inexperienced heavy goods vehicle drivers could be allowed to drive the vehicle, and also that stability on board Ro - Ro ship is excellent.

CLAIMS

1. An articulated wheeled vehicle of which the trailer portion has an overall height of substantially four metres and comprises two-tier accommodation for cattle standing transversely of the vehicle; the interior of the accommodation being subdivided by transverse dividers into three upper tier compartments and two lower tier compartments, said two lower tier compartments being situated in vertical alignment with two adjacent ones of said three upper tier compartments; and said accommodation further including a rear compartment of which the rear end is closed by a pivotally mounted tail-gate which, when lowered, acts as a ramp in order to permit cattle to be loaded into the upper tier compartments and into the lower tier compartments by way of the rear compartment and by way of a system of integral ramps which lead out of the rear compartment; the rear compartment being adapted to accommodate cattle, when the other compartments have been filled, on a floor whose height

above ground level is between those of the floors of the upper and lower tiers; the side walls of all of said compartments having vertically spaced horizontal substantially uninterrupted ventilator openings therein.

2. A vehicle as claimed in Claim 1, wherein the two lower tier compartments are placed so as to be rearwardly of the front compartment of the upper tier compartments and so as to be forwardly of the rear compartment.

3. A vehicle as claimed in Claim 1 or Claim 2, wherein a hinged trap-door forms part of the floor of the rear compartment and is liftable to reveal an angled ramp of said ramp system leading downwardly into the rear one of the lower tier compartments.

4. A vehicle as claimed in any one of the preceding Claims wherein the rearmost end of the rearmost compartment of the upper tier compartments is adapted to be closed by at least a hinged device which is part of said ramp system and serves as a ramp, when lowered, to give access to the upper tier compartments.

5. A vehicle as claimed in Claim 4, wherein said device is supplemented by a hinged door which is closable to confine the cattle in the rearmost compartment of the upper tier compartments before the hinged device is moved into its raised position.

6. A vehicle as claimed in any one of the preceding Claims, wherein one of the vertically spaced substantially uninterrupted ventilator openings is placed relatively close to floor level or is at a height above floor level which is approximately equal to one half of the height of the back of the animal above floor level and wherein said one ventilator opening is defined by the opposed edges of a downwardly directed limb and an upwardly directed limb, which limbs constitute parts of respective strengthening pieces and are of appropriate section (e.g. Z - section) and are located in a vertical plane which is disposed outwardly of the plane containing the inner surface of the side wall of the compartment.

7. An articulated wheeled vehicle constructed arranged and adapted to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

8. Any features of novelty, taken singly or in combination, of the embodiments of the invention hereinbefore described with reference to the accompanying drawings.